

**14.** The filling system of claim **10**, further comprising a weight scale, the weight scale determining the weight of the infusion pump assembly before filling a volume of fluid and the weight scale determining the weight of the infusion pump assembly after the reservoir is filled to a volume.

**15.** A vial adapter comprising:

a housing having a vial end configured to receive a vial and a receptacle end configured to attach to a fill adapter base and interior wall features; and

at least two vial fingers having a spring force attached to the interior of the housing and a bent portion and configured to maintain the position of the fluid vial wherein the fluid vial overcomes the spring force, wherein when the vial adapter is attached to the fluid vial, the bent portion and the top portion of the fluid vial are not in contact and a predetermined length of separation distance is maintained between the bent portion and a fluid vial septum,

wherein when the fluid vial is removed from the vial adapter, the fluid vial first moves the predetermined length of separation distance and the bent portion catches the top portion

of the fluid vial, and wherein a tip of a needle is removed from the fluid in the fluid vial and is located inside the fluid vial septum, whereby the fluid in the fluid vial will not continue to flow when the vial adapter is being removed from the fluid vial.

**16.** The vial adapter of claim **15**, further comprising a needle carriage slidably attached to the interior of the housing.

**17.** The vial adapter of claim **15**, further comprising a disc slidably attached to the interior of the housing, the disc having a first position on the receptacle end of the housing and a second position on the vial end of the housing and configured to matably attach to a needle carriage, wherein the needle carriage matably attaches to the disc and the needle carriage and disc slide to the vial end of the housing and wherein the disc is locked into a position on the vial end by interior wall features of the housing.

**18.** The vial adapter of claim **15**, further comprising at least one locking feature, the locking feature adapted to mate with at least one key feature on a fill adapter base.

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